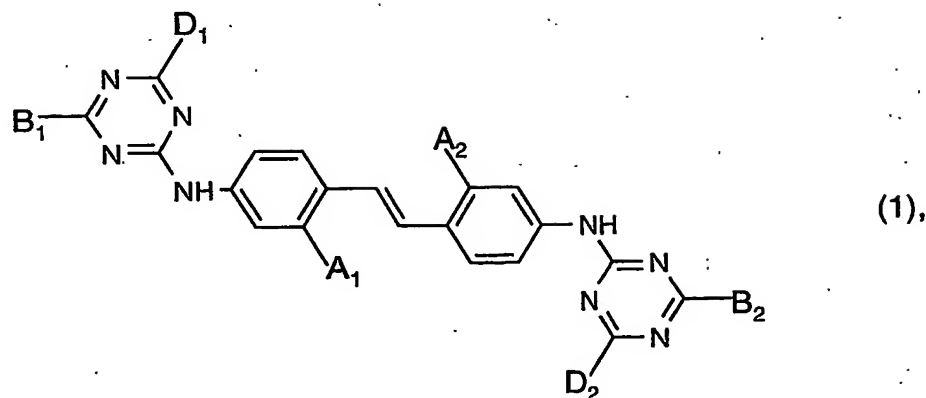


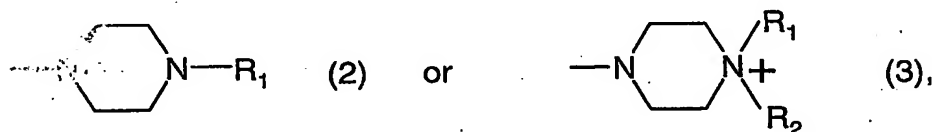
Claims

1. A compound of the formula



wherein

A₁ and A₂ each, independently of one another, represent -SO₃⁻ or -SO₃M, where M represents hydrogen, an alkaline or alkaline earth metal, ammonium or alkylammonium, B₁ and B₂ each, independently of one another, represent the moiety

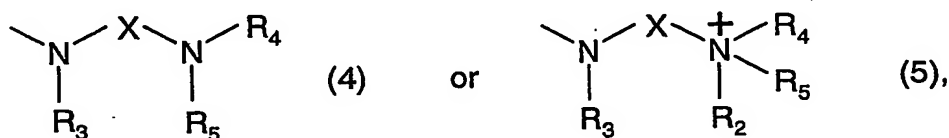


in which

R₁ represents hydrogen, a straight-chain C₁-C₁₂alkyl or branched C₃-C₁₂alkyl group which C₂-C₁₂alkyl and C₃-C₁₂alkyl group, respectively, may be interrupted by one or two heteroatoms and is unsubstituted or substituted by one or two -OH, -OC₁-C₄alkyl, -NH₂, -NHC₁-C₄alkyl, -N(C₁-C₄alkyl)₂, -N-pyrrolidino, -N-piperidino, -N-morpholino or -N⁺(C₁-C₄alkyl)₃ groups and

R₂ represents C₁-C₄alkyl, C₂-C₄hydroxyalkyl, -CH₂CONH₂, -CH₂COOH or -CH₂COO C₁-C₄alkyl or, alternatively,

B₁ and B₂ each, independently of one another, represent a group of the formula



in which

R₃, R₄ and R₅ each, independently of each other, represent hydrogen, C₁-C₄alkyl,

C₂-C₄hydroxyalkyl, the group -X'-NR₆R₇ or the group -X'-N⁺R₃R₆R₇, whereby at least one of the substituents R₄ and/or R₅ represents -X'-NR₆R₇ or -X'-N⁺R₃R₆R₇,

X and X' each, independently of each other, represent a straight-chain C₂-C₈alkylene or branched C₃-C₈alkylene chain, which is unsubstituted or substituted by one or two -OH or -C(=O)- groups,

R₆ and R₇ each, independently of each other, represent hydrogen, C₁-C₄alkyl or, together with the nitrogen atom to which they are bound, complete a pyrrolidino, piperidino or morpholino ring and

R₂ is as previously defined and each

D₁ and D₂, independently of one another, are either defined as for B₁ and B₂ or represent halogen, -NH₂, C₁-C₄monoalkyl- or dialkylamino, said alkyl groups being unsubstituted or substituted by C₁-C₄alkoxy, amino, mono- or di-C₁-C₄alkylamino or tri-C₁-C₄alkylammonium; C₂-C₄hydroxyalkylamino, C₂-C₄di(hydroxyalkyl)amino, anilino, an aniline monosulphonic acid or sulphonamide residue or a 5- or 6-membered, saturated heterocyclic ring or, alternatively, mixtures of compounds of formula (1).

2. A compound of formula (1), according to claim 1, in which the residues A₁ and A₂ are identical, B₁ and B₂ are identical and D₁ and D₂ are identical.

3. A three-component mixture of compounds of formula (1), according to claim 1, comprising two components, as defined in claim 2, and a third component in which the residues A₁ and A₂ are identical, but either, B₁ and B₂ are different or D₁ and D₂ are different.

4. A compound of formula (1), according to claims 1 or 2, in which the moieties B₁ and/or B₂ are represented by the formulae (2) and/or (3) and in which

R₁ represents hydrogen, a straight-chain C₁-C₄alkyl or branched C₃-C₄alkyl group which may be interrupted by one or two heteroatoms and is unsubstituted or substituted by one or two -OH, -OC₁-C₄alkyl, -NH₂, -NHC₁-C₄alkyl, -N(C₁-C₄alkyl)₂, -N-pyrrolidino, -N-piperidino, -N-morpholino or -N⁺(C₁-C₄alkyl)₃ groups,

A₁ and A₂ are both -SO₃⁻ or -SO₃M,

M, R₂, D₁ and D₂ being as defined according to claim 1.

5. A compound of formula (1), according to claim 4, in which the moieties B₁ and B₂ are identical and represented by the formulae (2) or (3), whereby

R_1 represents hydrogen, a straight-chain C_1 - C_4 alkyl or branched C_3 - C_4 alkyl group which may be unsubstituted or substituted by one or two $-OH$, $-OC_1$ - C_4 alkyl, $-NH_2$, $-NHC_1$ - C_4 alkyl, $-N(C_1$ - C_4 alkyl) $_2$, $-N$ -pyrrolidino, $-N$ -piperidino, $-N$ -morpholino or $-N^+(C_1$ - C_4 alkyl) $_3$ group,

R_2 represents C_1 - C_4 alkyl,

A_1 and A_2 are both $-SO_3^-$ or $-SO_3M$, whereby

M represents hydrogen, potassium or sodium and

D_1 and D_2 are identical and may be represented by halogen, especially chlorine, $-NH_2$, C_1 - C_4 monoalkyl- or dialkylamino, said alkyl groups being unsubstituted or substituted by mono- or di- C_1 - C_4 alkylamino or tri- C_1 - C_4 alkylammonium; C_2 - C_4 hydroxyalkylamino, C_2 - C_4 -di(hydroxyalkyl)amino, anilino, an aniline sulphonamide or sulphonic acid residue or a morpholino-, piperidino- or $-N$ - C_1 - C_4 substituted piperazino ring.

6. A compound of formula (1), according to claims 1 or 2, in which the moieties

B_1 and/or B_2 are represented by the formulae (4) and/or (5), whereby

R_4 represents the group $-X'-NR_6R_7$ or the group $-X'-N^+R_3R_6R_7$,

X and X' each, independently of each other, represent a straight-chain C_2 - C_4 alkylene or branched C_3 - C_8 alkylene chain, which is unsubstituted or substituted by one or two $-OH$ or $-C(=O)-$ groups,

R_3 and R_5 each, independently of each other, represent hydrogen, C_1 - C_4 alkyl or C_2 - C_4 hydroxyalkyl,

R_6 and R_7 each, independently of each other, represent hydrogen, C_1 - C_4 alkyl or, together with the nitrogen atom to which they are bound, complete a pyrrolidino, piperidino or morpholino ring,

A_1 and A_2 are both $-SO_3^-$ or $-SO_3M$,

M , R_2 , D_1 and D_2 being as defined according to claim 1.

7. A compound of formula (1), according to claim 6, in which the moieties

B_1 and B_2 are identical and represented by the formulae (4) or (5) whereby

R_4 represents the group $-X'-NR_6R_7$ or the group $-X'-N^+R_3R_6R_7$,

X and X' each, independently of each other, represent a C_2 - C_4 alkylene chain, which is unsubstituted or substituted by $-OH$,

R_3 and R_5 each, independently of each other, represent hydrogen or C_1 - C_4 alkyl,

R_6 and R_7 each, independently of each other, represent hydrogen, C_1 - C_4 alkyl or, together with the nitrogen atom to which they are bound, complete a pyrrolidino, piperidino or morpholino ring,

R_2 represents C_1 - C_4 alkyl,

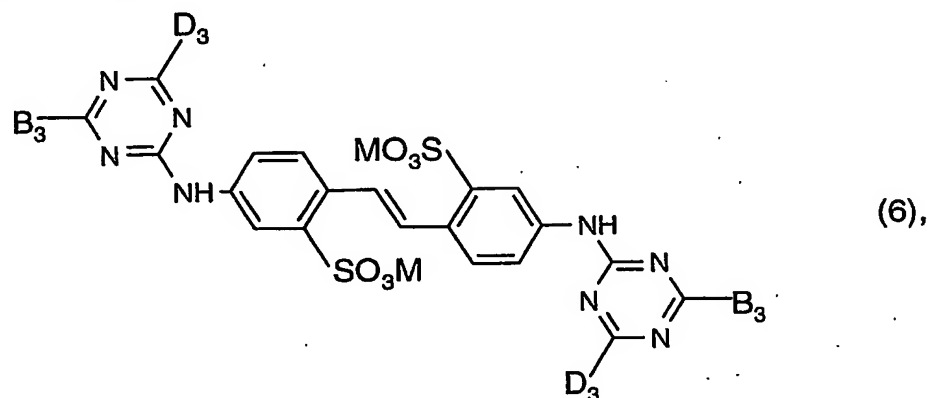
A_1 and A_2 are both $-\text{SO}_3^-$ or $-\text{SO}_3\text{M}$, whereby

M represents hydrogen, potassium or sodium and

D_1 and D_2 are identical and may be represented by halogen, especially chlorine, C_1 - C_4 monoalkyl- or dialkylamino, said alkyl groups being unsubstituted or substituted by mono- or di- C_1 - C_4 alkylamino or tri- C_1 - C_4 alkylammonium; C_2 - C_4 hydroxyalkylamino, C_2 - C_4 -di(hydroxyalkyl)amino, anilino, an aniline sulphonamide residue or a morpholino-, piperidino- or -N- C_1 - C_4 alkylsubstituted piperazino ring, an anilino residue being preferred.

8. A process for the preparation of a compound of formula (1), or for mixtures of compounds, as defined in claim 3, by reacting, under known reaction conditions, cyanuric chloride, successively, in any desired sequence, with each of 4,4'-diaminostilbene-2,2'-disulphonic acid, an amino compound capable of introducing groups B_1 and/or B_2 or precursors or mixtures thereof and an amino compound capable of introducing groups D_1 and/or D_2 or precursors or mixtures thereof, B_1 , B_2 , D_1 and/or D_2 being as defined in claim 1.

9. A compound of the formula



wherein

B_3 represents a group of the formula $-\text{NH}(\text{CH}_2)_n\text{NR}_8\text{R}_9$, n being 2, 3 or 4 and

D_3 represents halogen, an anilino, anilino-sulphonic acid or anilino-sulphonamide residue,

R_8 and R_9 each, independently of each other, represent hydrogen, C_1 - C_4 alkyl, C_2 - C_4 -hydroxyalkyl or, together with the nitrogen atom to which they are bound, complete a

pyrrolidino, piperidino or morpholino ring and M , is as defined in claim 1, with the proviso that

those compounds in which D_3 is anilino, B_3 is an N-(3-aminopropyl)-diethanolamino, N,N-dimethyl-1,3-propanediamino or 4-(3'-aminopropyl)morpholine residue or in which D_3 represents a sulphanilamide residue and B_3 is a 4-(3'-aminopropyl)morpholine residue and M is hydrogen are excluded.

10. A process for the preparation of a compound of formula (6) by reacting, under known reaction conditions, cyanuric chloride, successively, in any desired sequence, with each of 4,4'-diaminostilbene-2,2'-disulphonic acid, an amino compound capable of introducing groups B_3 and an amino compound capable of introducing groups D_3 , B_3 and D_3 being as defined in claim 9.

11. Use of the compounds of formula (1) or mixtures thereof, as optical brightening agents for synthetic or natural organic materials.

12. Use of the compounds of formula (1) according to claim 10 as optical brightening agents for paper in pulp, size-press, metering press or coating applications.

13. Use of the compounds or mixtures, as defined in claim 3, as optical brightening agents for paper in pulp, size-press, metering press or coating applications.